NOTES ON *PILOCEREUS, MONVILLEA* AND *MALACOCARPUS* WITH SPECIAL REFERENCE TO COLOMBIAN AND VENEZUELAN SPECIES

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Pilocereus Lemaire

(nomen genericum conservandum propositum, 1937)

The use of the names *Pilocereus* and *Cephalocereus* is fraught with much controversy. It is fortunate, consequently, that both should have been proposed for conservation by Werdermann (in Kakteenkunde 1937: 116-118, 120-130. 1937). The type species of *Pilocereus* in Werdermann's proposal is to be *P. leucocephalus* Poselg., illustrated with the proposal (op. cit., 129 fig.), and that of *Cephalocereus* is to remain *C. senilis* (Haw.) Pfeiff., also illustrated in the proposal (op. cit., 116 fig.)

The main distinguishing character between *Pilocereus* and *Cephalocereus* in the sense of Werdermann lies in the fruit. This, in *Pilocereus*, is globose-depressed as a rule, smooth, with persistent floral relics and irregularly splitting at maturity (Brasil Säulenkakt. 99. 1933); in *Cephalocereus* (op. cit., 114) the fruit is smooth, slender-clavate or turbinate, resembling the berry of *Melocactus* but thicker, and emerging from the cephalium at maturity; the relics of the flower are marcescent, they persist awhile but fall off when the fruit ripens, the fall being caused by the ultimate appearance of a corky layer.

Werdermann proposes to conserve *Pilocereus* in a wholly misapplied sense by following Schumann, it being well known that *Pilocereus* - as pointed out by Britton & Rose (Cact. 2: 25. 1920) - is a superfluous name for *Cephalocereus*. The principle has been accepted in the Rules of International Nomenclature as early as 1905 that generic names can be conserved in a wholly misapplied sense (see *Podocarpus* and *Phyllocladus* among the *Nomina Generica Conser-*

anda), so that no objection can be raised against Werdermann's proposal on the ground that it entails a breach of the "Type Method", so called. It might be added that long before Schumann interpreted *Pilocereus* in the manner which Werdermann intends to perpetuate, Lemaire himself (in Rev. Hort. 1862: 426-430. 1862) had recast its definition, including under its subdivision "C" *P. Houlletii,* which is a synonym of *P. leucocephalus,* the *species lectotypica* under Werdermann's proposal. Believing that Werdermann's proposal is timely and practical, I concur in it, pointing out - merely for the sake of bibliography and citation - that the proper reference to *Pilocereus* Lem. *nom. conserv.* is not to Schumann in Engl. & Prantl Nat. Pflanzenf. 3 (6). 1894. as claimed by Werdermann (in. op. cit. 130), but to Lemaire *p. p.* (quoad Subdiv. incertae sedis "C") in Rev. Hort. 1862.

It is my belief however, that Werdermann's concept of this genus does not agree with the characters of the fruit of *Cephalocereus senilis.* As I have pointed out in a preliminary semi-popular article (in Jour. Cact. Succ. Soc. Amer. 14: 169. 1942), this fruit is hardly the one which Werdermann visualizes, and I have no doubt that *Cephalocereus* is misapplied in connection with the Brazilian cacti which are classified under this genus by Werdermann (Brasil. Säulenkakt. 113-119. 1933). Likewise, I cannot believe that the cephalium is a generic character, being satisfied that the authors who have used it in systematics have not understood it at all. These objections, however, have nothing to do with the proposal of conserving *Pilocereus* and *Cephalocereus.* They are merely meant as a suggestion that a better study of the fruits of *C. senilis* and of *P. leucocephalus* may ultimately prove that *Cephalocereus,* although valid in nomenclature, is not to be used in the manner Werdermann indicates. I doubt whether true *Cephalocereus,* with the dry, scaly and flocculose fruit of *C. senilis* of Mexico, is actually represented in Colombia and in South America generally. As *Cephalocereus,* Britton & Rose understand (Cact. 2: 25-60. 1920) a mixture mostly belonging to *Pilocereus* in the sense of Werdermann and my own.

In a trip undertaken to northern South America before 1930, Backeberg visited the coastal region of Venezuela and Colombia for the purpose of collecting cacti for commercial uses. Backeberg's publications are a source of much trouble to the professional taxonomist, as a rule, for his names appear in horticultural publications, sometimes rare or little known, and are often used under different generic headings. It is convenient, therefore, to dispose of nearly everything which Backeberg has done with the cacti of Colombia at the outset, with the assurance that coming work on the Cactaceae in Colombia will be handled by professional botanists.

The earliest account of Backeberg's trip appears in a horticultural periodical, Moellers Deutsche Gaertner-Zeitung, 45: 81-82. March 1st, 1930. It is illustrated, p. 81, by the photographs of *Pilocereus Fricii* Backeb. sp. nov., and *P. Backebergii* Weing. sp. nov. Sketchy caracterizations are given, p. 82, for the following novelties: *P. Moritzianus*, var. *robustus* and var *curvispinus*. *P. Weingartii*, *P. Fricii*, *P. Bergerii*, *P. Klousacekii*, *P. horrispinus*, *P. remolinensis*, *P. atro-viridis*, *P. multispinus*, *P. claro-viridis*, *P. Backebergii*, *P. Llanosii*. Of these novelties *P. horrispinus*, *P. remolinensis*, *P. atro-viridis* and *P. multispinus* are credited to Colombia, the balance so far I may gather, to Venezuela. These names are *nomina subnuda* of uncertain status, although those illustrated (*P. Fricii* and *P. Backebergii*) are to all appearances validly published.

In a book of popular appeal, "Kakteenjagd zwischen Texas und Patagonia", published at some uspecified date in 1930, Backeberg contributes a chapter (pp. 16-46) on his Venezuelan and Colombian quest; he again illustrates *Pilocereus Fricii* (p. 25) and *P. remolinensis* (p. 45), giving of the latter a good habit-picture with the caption: "Der Letzte seines Stammes: Pilocereus remolinensis", which implies that this plant was the last to be seen of its kind.

In August 1930 Backeberg undertook to publish his novelties in a manner acceptable to orthodox taxonomy. This he did (in Monatsschrift Deutschen Kakt.—Gesell. 2: 161-167) using *Cereus* instead of *Pilocereus*. No further mention is made of the new varieties of *P. Moritzianus*, nor of *P. Weingartii*, *P. Bergerii*, *P. Klousacekii*, *P. atroviridis*, *P. multispinus*, *P. claro-viridis* and *P. Llanosii*. Backeberg merely describes: *C. remolinensis* (pp. 162-163, fig.); *C. horrispinus* (pp. 164-165, fig.): *C. Fricii* (pp. 165-166, fig.); *C. Backebergii* Weing. ex Backeb. (p. 167, fig.), and the continuation of the article in which this appears was never written despite the statement made to the contrary at the end of the article itself. In 1931, however, Backeberg took up *C. atroviridis* and *C. claroviridis* in a private publication (Neue Kakteen 69) which I have so far not seen. A year later still, these two cacti were described in Latin by Werdermann (in Fedde

Repert. 3: 59-60. 1932). The fruit of *C. atroviridis* is known, and there is a possibility that Werdermann preserved it in the herbarium of Berlin; *C. claroviridis,* on the contrary, was characterized from a sterile specimen. I have not been able to learn what happened to *P. Weingartii, P. multispinus, P. Bergerii, P. Klousacekii* and *P. Llanosii* after their first announcement in 1930 as *nomina subnuda.* Backeberg apparently decided to ignore them for reasons only known to himself. All these binomials consequently may be consigned to the limbo of *nomina subnuda incertissimae sedis.*

In the formal treatment that follows I attempt to dispose of Backeberg's entities. Some of these species are credited to Colombia, others to Venezuela but it is convenient to consider them jointly, as there is no definite limit to the coastal flora of these two countries. Backeberg has placed all these species both under *Pilocereus* and *Cereus* in a wholly unorthodox manner (as it is his custom) so that it is more a matter of opinion that of fact where the publication actually took place and when a new combination was effected. It may be noticed, however, that the original mention is made under *Pilocereus,* and that this genus is the one accepted in the Kaktus-ABC, 1935, which is Backeberg's most authoritative work to date. A reference to *Cereus* in parenthesis in the citations below means that this genus is used in the work cited.

Backeberg is also known to have published shortly before the outbreak of the present war (in Blaett. Kakteenforsch. 1936-1938) various generic segregates, such as *Subpilocereus, Micranthocereus* and *Austrocephalocereus* (see Gray Index; Marshall & Bock, Cact. 72. 1942). That these names - granted they have been validly published - merely add to synonymy seems certain. A discussion of this nomenclature, and of the further changes that Backeberg might have made after 1939, cannot be given at present.

Pilocereus remolinensis Backeb. in Moell. Deutsch. Gaertn.—Zeit. 45: 82. 1930; Kakteenjagd 43-45 fig. 1930; - (*Cereus*) Monatsschr. Kakt.—Gesell. 2: 162-163. fig. 1930; - Backeberg & Knuth, Kakt.—ABC 327. 1935.

The type locality is Remolino, Magdalena, Colombia. The fruit is said to be yellowish-green, globose-elongate (*laenglichrund*), free of persistent floral remnants. This description answers Backeberg's concept of *Pilocereus* "Raekke' *Oblongicarpi* (in Backeb. & Knuth, Kakt.—ABC 73, 326. 1935) (*). Considering that Backeberg claims that the plant from which the type-material was collected is the "last of its kind", *Pilocereus remolinensis* should be retained as *species dubia* until full material is secured which agrees with the otherwise good photograph of the tip of a young stem in what I believe to be the formal publication (as *Cereus,* in Monatsschr. Kakt.—Gesell. 2: fig. 163. 1930).

(*) This "Raekke", as well as *Globicarpi* Backeb. (op. cit., 73, 327) does not seem to have been validly published. I find it characterized in Danish without Latin diagnosis in the cited Kaktus-ABC, which was out of press in 1935 only (see Art. 38 Inter. Rul. Nomencl.). Since it is convenient to effect a valid publication of these two entities, I give for them here the Latin diagnosis, translating the Danish original:

Pilocereus Sect. **Oblongicarpi** Backeb. in Croiz. - Fructus elongatus, reliquiis floralibus persistentibus nullis. - Species typica: *P. Russellianus* (Otto) Rümpl. (cf. Britton & Rose, Cact. 2: 33, fig. 37. 1920).

Pilocereus Sect. **Globicarpi** Backeb. in Croiz. - Fructus plus minusve rotundato-depressus, intus saepius saturate coloratus reliquiis floralibus persistentibus. Species typica: *P. Moritzianus* (Otto) Lem. (cf. Britton & Rose, Cact. 2: 42. fig. 60. 1920).

The designation of the standard-species is my own. The illustrations cited from Britton & Rose (under *Cephalocereus*) seem to me to exemplify the concepts of Backeberg in a graphic manner. It might be added that Backeberg (op. cit., 326-327) puts under Sect. *Oblongicarpi* only *P. albispinus* (S.-D.) Rümpl. (*Species dubia,* sensu Britt. & Rose. *op. cit.* 2: 59); *P. Fricii* Backeb.; *P. Russellianus* (Otto) Rümpl.; *P. horrispinus* Backeb.; *P. remolinensis* Backeb.; *P. atroviridis* Backeb. All other species (about 60 in Backeberg & Knuth's treatment. pp. 327-335) are referred to Sect. *Globicarpi.* Since *P. leucocephalus* Poselg., designated by Werdermann as the standard-species of *Pilocereus* emend., belongs to the *Globicarpi,* it is this Section that is typic of the genus. This means that Sect. *Oblongicarpi* may be removed from *Pilocereus* and tranferred to another genus or made into a genus of its own, if necessity dictates. *Globicarpi,* on the contrary, is permanently attached to *Pilocereus* as the typic section; it cannot be transferred to a genus other than *Pilocereus,* or be turned into a genus of its own.

Pilocereus atroviridis Backeb. in Moell. Deutsch. Gaertn.—Zeit. 45: 82. 1930; (*Cereus*, fide: Gray Index) Neue Kakt. 69. 1931; (*Cereus*), Werderm. in Fedde Repert. 30: 59. 1932; Backeb. & Knuth Kakt.—ABC 327. 1935.

Werdermann describes this plant as erect, many-branched, 12 m. tall; branches to 20 cm. thick, dark green, white-hairy at the tips; ribs crenate, at first about 8; spines ca. 11 white with dark tips: radial ca. 8, 0,5 - 1 cm. long. central 3, the longest 2 cm. Flowers unknown; fruit oblong, reddish-green, the flesh white; seeds black, dull. Type locality: the northern coast of Colombia. This cactus, growing in soil rich in humus among bushes, is said to be rare but to attain great size.

It is impossible to treat this species otherwise than as doubtful; good material must be had to certify it.

Pilocereus claroviridis Backeb. in Moell. Deutsch. Gaertn.—Zeit. 45: 82. 1930; (*Cereus,* fide: Gray Index) Neus Kakt. 69. 1931; (*Cereus*) Werderm. in Fedde Repert. 30: 60. 1932; Backeb. & Knuth Kakt.—ABC 330. 1935.

Werdermann avers that this species is close to *P. Moritzianus* Otto, from which it differs in the greener color, the more robust growth, the longer and stouter spines on old branches (these being unarmed in *P. Moritzianus*). The type-locality is Caracas, Venezuela, at ca. 1000 m. altitude. The description suggests a state of *P. Moritzianus* rather than a separate authentic species.

Pilocereus Russellianus (Otto) Rümpl. in Foerst. Hand. Cact., ed. 2. 682. 185; Backeb. & Knuth Kakt.—ABC 327. 1935.

Cereus Russellianus Otto ex Salm-Dyck Cact. Hort. Dyck. 1849. 201. 1850.

Cephalocereus Russellianus (Otto) Rose in Stand. Cycl. Hort. Bailey 2: 715. 1914; Britt. & Rose Cact. 2: 33. 1920.

Pilocereus Fricii Backeb. in Moell. Deutsch. Gaertn.—Zeit. 45: 81, fig. 82. 1930; Kakteenjagd 25, fig. 1930; (*Cereus*) in Monatsschr. Kakt.—Gesell. 2: 164-166, fig. 1930; Backeb. & Knuth, Kakt.—ABC 326. 1935.

Even a casual comparison of the descriptions and illustrations of Britton & Rose and Backeberg is sufficient to prove that *P. Russellianus* and *P. Fricii* are identically the same. This evidence is definitely confirmed by the localities, all of which are along the northern coast of Colombia and Venezuela, both for Rümpler's and Backeberg's species.

Pilocereus Moritzianus (Otto) Lem. in Ill. Hort. *in not. post Tab. 469*, 1866.

Cereus Moritzianus Otto ex Pfeiffer En. Cact. 84. 1837.

Cephalocereus Moritzianus (Otto) Britt. & Rose Cact. 2: 41. 1920.

Pilocereus Backebergii Weing. in Backeb. in Moell. Deutsch. Gaertn.—Zeit. 45: 81, fig. 82. 1930; (*Cereus*) in Monatsschr. Kakt.—Gesell. 2: 167, fig. 1930; Backeb. & Knuth Kakt.—ABC 329. 1904.

The illustrations of *P. Backebergii*, as cited, perfectly agree with a photograph identified as *P. Moritzianus* by Backeberger himself (Kakteenjagd 23. 1930). The type locality of *P. Backebergii* is Puerto Cabello, Venezuela, while that of *P. Moritzianus* is La Guayra, Venezuela, the two ranges being floristically one. Britton & Rose speak of Puerto Cabello and La Guayra as localities where *P. Moritzianus* is common.

Pilocereus horrispinus Backeb. in Moell. Deutsch. Gaertn.—Zeit. 45: 82. 1930; (*Cereus*) in Monatsschr. Kakt.—Gesell. 2: 164-165, fig. 1930; Backeb. & Knuth Kakt.—ABC 327. 1935.

The type locality is Puerto Colombia, Colombia. Backeberg states having seen but two plants which suggested *P. Russellianus* at first sight, but diferred from that species in the habit. *Pilocereus Russelianus* is said by Backeberg to have a tendency to become decumbent on surrounding bushes, while *P. horrispinus* is supposed to be strictly erect. When wounded, *P. horrispinus* oozes a dark sap, soon hardening; its fruit would seem to be rather long-rounded, pink with a bluish bloom. The height of the plant attains to 5 m. and the growth is generally robust. The branches have 4 to 5 ribs, these 5-10 mm. high. The spines number 5 to 7, ca. 2,5 cm. long; the areoles are set about 4 cm. apart, quite woolly at first, later glabrescing; the seed is like that of *P. Russelianus*.

The illustration shows a young sterile stem, and should be matched without much difficulty by live material collected at the type-locality. I incline to believe that *P. horrispinus* is a form of *P. Russelianus*, not a good species. As it is well known, the habit in the cereoid group is unsteady. From careful field observation Werdermann states that *Cereus Jamacaru*, for instance, is exceedingly variable in habit and spinescence (Brasil Säulenkakt. 90, 1933), it being possible to collect a whole assortment of "varieties" from the same individual. *Pilocereus salvadorensis* Werderm., likewise (op. cit., 110) is tree-like and much branched when growing isolated but develops longer and fewer branches when surrounded by other plants in a thicket. Analogous remarks are made by Frere Marie-Victorin (Contr. Inst. Bot. Univ. Montreal 41: 100. 1942) on the Pereskias of Cuba.

Monvillea Britton & Rose

The genus was published (Cact. 2: 21. 1920) to take care of cacti resembling *Cereus* sensu Britt. & Rose in blossom, and to some extent in fruit, but unlike typic *Cereus* in the long, slender, many-jointed stems suggesting the forms currently classified as *Harrisia* or *Eriocereus*. As defined by Britton & Rose, it includes plants that do not range northward beyond Loreto, Peru, and Southern Ecuador. Werdermann denies its generic status (in Fedde Repert. 30: 60-61. 1932; Brasil. Säulenkakt. 87 *et seq.* 1933), but evidently grants it some measure of recognition, though of uncertain rank, in his key to the Brazilian species of *Cereus*. These he breaks up (Brasil. Säulenkakt. 88. 1930) in two groups, namely, (A) *Piptanthocereus* - Mostly tall columnar plants with robust branches; flowers falling by abcission after fertilization, the style persisting; (B) *Monvillea* - Weak-branched plants; floral relics drying upon the ovary and long-persistent.

In my opinion, our knowledge of the Cactaceae is better served by the frank recognition of *Monvillea* as a distinct genus. Jointly considered, the habit and the floral characters are of the generic order; the species in this affinity constitute, in addition, a fairly well defined natural group, as we know it.

Monvillea Smithiana (Britt. & Rose) Backeb. in Backeb. & Knuth Kakt.—ABC 184. 1935.
Cephalocereus Smithianus Britt. & Rose Cact. 2: 37. 1920.

Pilocereus Smithianus (Britt. & Rose) Backeb. in Moell. Deustch. Gaertn.—Zeit. 45: 81-82. 1930; Kakteenjagd 26, fig. 1930.
Cereus Smithianus (Britt. & Rose) Werderm. in Fedde. Repert. 30: 61. 1932.

Britton & Rose commented that the flowers of *C. Smithianus* were not "quite typical of the genus". The splendid photograph of the Kakteenjagd shows that this plant is correctly treated under *Monvillea*. The classic locality is "Below Zig Zag, between La Guayra and Caracas, Venezuela", but this, or other species of this affinity may also be looked for in Colombia.

Malacocarpus Salm-Dyck

This genus was believed to be strictly confined to Uruguay, Southern Brazil, Paraguay and Argentina, until the comparatively recent discovery of a species credited to it in Colombia. I record it here as it is now accepted. suggesting meantime that a careful study remains to be made of the relationship between *Malacocarpus* and *Discocactus* Pfeiffer. The cephalium of *Cactus* or *Melocactus* (the nomenclature issue betwen these names is as yet unsettled but will be discussed in a coming contribution) is a region in which vegetative growth is wholly suppressed in favor of floral growth. Since vegetative growth in the Cactaceae of the echinocactoid description (to which *Cactus* belongs) manifests its presence by the development of areoles with characteristic strong spines, spinescent areoles are no longer produced in a *Cactus* (*Melocactus*) of flowering age; the whole top of the plants is occupied by a mass of strictly fertile areoles, forming the cephalium. The cephalium in these plants, consequently, may be compared to the terminal flower-cluster of a rutaceous or araliaceous plant, the only difference between these structures being that the cephalium is long-lived and nearly permanent, while the usual inflorescence is transitory.

In other groups closely related with *Cactus* (*Echinocactus*, *Malacocarpus* and the like) the vegetative growth at the apex of the plant is slowed down but not suppressed when the plant reaches maturity. Thus, the apex of these cacti is occupied at all times by a flattish region of young areolar growth, which yields in time both flowers and strong spines. This young areolar growth differs from a true cephalium of *Cactus* merely because it is still capable of producing sterile growth, that is, areoles with strong spines functionally incapable of flower-bearing. Everything suggests that it is difficult to draw a line of distinction between all these structures, and that the absolute cephalium of *Cactus* will eventually be found to merge by degrees with the relative one of *Malacocarpus* and *Echinocactus*.

The presence of *Malacocarpus* and *Cactus* in Colombia, and the known wealth of plants of this country, suggest that a careful study of its cacti may yet yield forms of great interest both for the taxonomy and the morphology of the family.

Malacocarpus Vorwerkianus (Werderm.) Backeb. in Backeb. & Knuth Kakt.—ABC 253. 1935 (as *Worwerckianus*).

Echinocactus Vorwerkianus Werderm. in Fedde Repert. 30: 65. 1932; in Monatsschr. Deutsch. Kakt.—Gesell. 4: 1 fig. 1932.

The typification of *Echinocactus* presents problems of nomenclature fully as knotty as that of *Cereus* previously discussed (Caldasia II, 7: 117 - 122. 1943). An excellent case can be made for retaining the name *Echinocactus* in connection with such form as *E. Vorwerkianus,* which is apparently a close ally of *Malacocarpus Sellowii* (Link & Otto) Schum. However, the use of the name *Echinocactus* has been restricted by Britton & Rose (Cact. 3: 171. 1922) to a definite group of plants in Mexico and the United States, which are clearly not congeneric with Schumann's *Malacocarpus Sellowii.* Britton & Rose's selection of a doubtful species, *E. platyacanthus* Link & Otto, as the type-binomial of *Echinocactus* is unfortunate, but their concept of *Echinocactus* has been so widely accepted in the two Americas and in Europe that grave disturbances to existing nomenclature would take place if new concepts - historically and nomenclaturally correct as they might be - were introduced at this date. There is not doubt that the lone Colombian species in this affinity is better treated by Backeberg under *Malacocarpus* than it is by Werdermann under *Echinocactus*. The *locus classicus* is "Sagamoso, north-east of Bogotá, at an approximate altitude of 1200 m. in pastures". (*) This plant is in cultivation, and does well indeed under glass.

(*) Sogamoso, in the Department of Boyacá, 210 kilometers north-east of Bogotá, to all appearances, although the altitude of this locality is 2570 m. above sea level.